



US00D928195S

(12) **United States Design Patent** (10) **Patent No.:** **US D928,195 S**  
**Wassell et al.** (45) **Date of Patent:** **\*\* Aug. 17, 2021**

(54) **DISPLAY SCREEN OR PORTION THEREOF WITH A GRAPHICAL USER INTERFACE FOR ANALYZING AND PRESENTING DRILLING DATA**

(71) Applicant: **APS Technology, Inc.**, Wallingford, CT (US)

(72) Inventors: **Mark Ellsworth Wassell**, Houston, TX (US); **Rudolph Popeszku**, Houston, TX (US)

(73) Assignee: **APS Technology, Inc.**, Wallingford, CT (US)

(\*\*) Term: **15 Years**

(21) Appl. No.: **29/679,985**

(22) Filed: **Feb. 12, 2019**

**Related U.S. Application Data**

(63) Continuation of application No. 29/460,812, filed on Jul. 15, 2013, now Pat. No. Des. 843,381.

(51) **LOC (13) Cl.** ..... **14-04**

(52) **U.S. Cl.**  
USPC ..... **D14/488**

(58) **Field of Classification Search**  
USPC ..... D14/485-495; D20/11; D21/324, 325  
(Continued)

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

26,152 A \* 11/1859 Allen ..... G01D 11/24 73/866.3  
2,309,941 A 2/1943 Drummond  
(Continued)

**FOREIGN PATENT DOCUMENTS**

CN 1346929 A 5/2002  
CN 2721874 Y 8/2005  
(Continued)

**OTHER PUBLICATIONS**

“Suredrill Optimizer” Oct. 1, 2015, posted ataps-tech.com, [site visited Apr. 7, 2021]. <https://www.aps-tech.com/systems/suredrill-drilling-optimization-vibration-management/suredrill-apps-drilling-optimization-software-packages/suredrill-optimizer-real-time-well-drilling-optimization> (Year: 2015).\*

(Continued)

*Primary Examiner* — John M Otte

(74) *Attorney, Agent, or Firm* — Offit Kurman, P.A.; Gregory A. Grissett

(57) **CLAIM**

The ornamental design for a display screen or portion thereof with a graphical user interface for analyzing and presenting drilling data, as shown and described.

**DESCRIPTION**

FIG. 1 is a front view of a display screen or portion thereof with a graphical user interface for analyzing and presenting drilling data;

FIG. 2 is a detailed view of a portion of the display screen shown in FIG. 1;

FIG. 3 is a detailed view of a portion of the display screen shown in FIG. 2;

FIG. 4 is a detailed view of a portion of the display screen shown in FIG. 1;

FIG. 5 is a detailed view of a portion of the display screen shown in FIG. 4;

FIG. 6 is a detailed view of a portion of the display screen shown in FIG. 1;

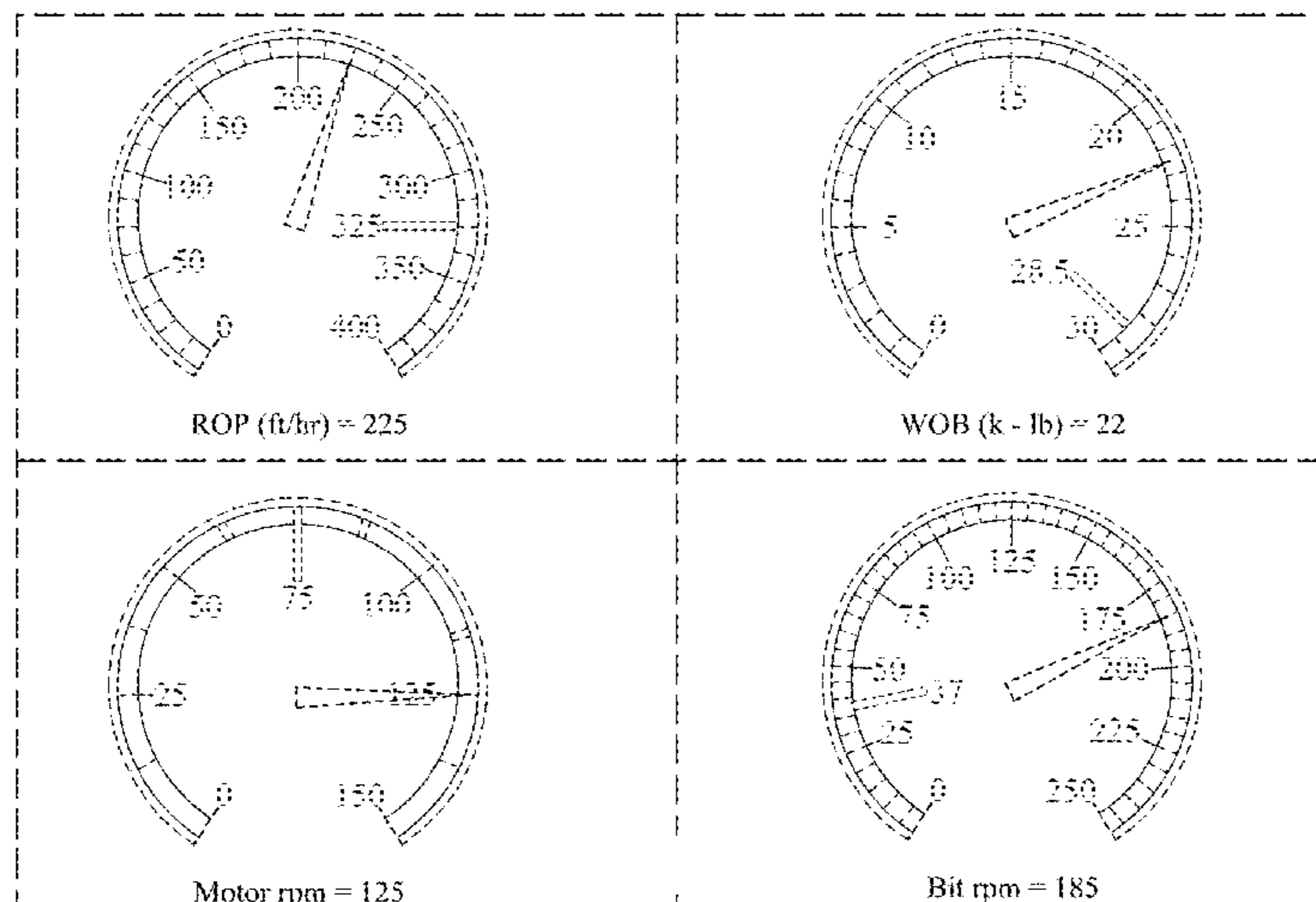
FIG. 7 is a detailed view of a portion of the display screen shown in FIG. 6;

FIG. 8 is a detailed view of a portion of the display screen shown in FIG. 1; and,

FIG. 9 is a detailed view of a portion of the display screen shown in FIG. 8.

The broken line showing of a display screen with graphical user interface is included for the purpose of showing portions of the article and forms no part of the claim.

**1 Claim, 9 Drawing Sheets**



(58) **Field of Classification Search**  
 CPC .... G06F 3/048; G06F 3/0481; G06F 3/04817;  
 G06F 3/0482; G06F 3/0483; G06F  
 3/04842; G06F 3/0485; G06F 3/04855;  
 G06F 3/0486; G06F 3/0488; G06F  
 3/04886; G06F 9/4443; G06F 17/211;  
 G06F 17/212; G01D 11/24; B60K 35/00;  
 B60K 37/02; E21B 44/00; G05B  
 23/0267; G16H 20/70; G16H 13/40;  
 B64D 43/00

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,507,341 A 4/1970 Basgan  
 3,626,482 A 12/1971 Quichaud et al.  
 3,813,656 A 5/1974 Fowler  
 4,019,148 A 4/1977 Shawhan  
 4,120,198 A 10/1978 Tanguy et al.  
 D253,691 S 12/1979 Bljumshtein et al.  
 D253,811 S 1/1980 Bljurnshtein et al.  
 4,254,481 A 3/1981 Smither et al.  
 D263,125 S 2/1982 Taylor  
 4,380,172 A 4/1983 Imam et al.  
 4,507,735 A 3/1985 Moorehead et al.  
 D293,422 S 12/1987 Nunes  
 4,715,451 A 12/1987 Bseisu et al.  
 D302,394 S 7/1989 Merrell  
 4,903,245 A 2/1990 Close et al.  
 D307,127 S \* 4/1990 Simons ..... D12/192  
 4,954,998 A 9/1990 Rector  
 4,958,125 A 9/1990 Jardine et al.  
 4,968,930 A 11/1990 Grupp et al.  
 5,141,061 A 8/1992 Henneuse  
 5,160,925 A 11/1992 Dailey et al.  
 5,220,963 A 6/1993 Patton  
 5,226,332 A 7/1993 Wassell  
 5,259,468 A 11/1993 Warren et al.  
 5,269,383 A 12/1993 Forrest  
 5,314,030 A 5/1994 Peterson et al.  
 5,332,048 A 7/1994 Underwood et al.  
 5,358,059 A 10/1994 Ho  
 5,368,108 A 11/1994 Aldred et al.  
 5,448,911 A 9/1995 Mason  
 5,646,611 A 7/1997 Dailey et al.  
 D384,341 S 9/1997 Hoffman et al.  
 5,721,376 A 2/1998 Pavane et al.  
 5,812,068 A 9/1998 Wisler et al.  
 5,842,149 A 11/1998 Harrell et al.  
 5,857,530 A 1/1999 Gronseth  
 5,880,680 A 3/1999 Wischart et al.  
 6,012,015 A 1/2000 Tubel  
 6,021,377 A 2/2000 Dubinsky et al.  
 6,023,658 A 2/2000 Jeffryes  
 6,088,294 A 7/2000 Leggett, III et al.  
 6,092,610 A 7/2000 Kosmala et al.  
 6,101,444 A 8/2000 Stoner  
 6,205,851 B1 3/2001 Jogi  
 6,206,108 B1 3/2001 MacDonald et al.  
 6,223,524 B1 5/2001 Durcan  
 6,227,044 B1 5/2001 Jarvis  
 6,272,434 B1 8/2001 Wisler et al.  
 6,296,066 B1 10/2001 Terry et al.  
 6,308,787 B1 10/2001 Alft  
 6,310,559 B1 10/2001 Labrode et al.  
 D452,693 S 1/2002 Mitchell  
 6,347,282 B2 2/2002 Estes et al.  
 6,356,284 B1 \* 3/2002 Manduley ..... G06F 3/0483  
 715/779  
 6,371,204 B1 4/2002 Singh et al.  
 6,405,808 B1 6/2002 Edwards et al.  
 6,415,878 B1 7/2002 Cargill et al.  
 6,419,014 B1 7/2002 Meek et al.  
 6,466,235 B1 10/2002 Smith et al.  
 D465,167 S 11/2002 Hayashi et al.

6,547,016 B2 4/2003 Wassell  
 6,564,883 B2 5/2003 Fredericks et al.  
 6,609,579 B2 8/2003 Krueger et al.  
 6,637,523 B2 10/2003 Lee et al.  
 6,637,524 B2 10/2003 Kruspe et al.  
 6,662,110 B1 12/2003 Bargach et al.  
 6,667,726 B1 \* 12/2003 Damiani ..... B60K 35/00  
 345/1.1  
 6,714,138 B1 3/2004 Turner et al.  
 6,732,052 B2 5/2004 MacDonald et al.  
 D493,397 S 7/2004 Tuzar et al.  
 6,785,641 B1 8/2004 Huang  
 D496,940 S 10/2004 Fetterman  
 6,812,942 B2 \* 11/2004 Ribak ..... B60K 35/00  
 345/30  
 6,820,702 B2 11/2004 Niedermayr et al.  
 D499,367 S 12/2004 Sauter et al.  
 6,883,393 B2 4/2005 Ishimaru  
 D511,167 S 11/2005 Blencowe  
 D511,704 S 11/2005 Zwingmann  
 6,968,909 B2 11/2005 Aldred et al.  
 D514,996 S 2/2006 Rayburn  
 7,003,439 B2 2/2006 Aldred et al.  
 7,020,597 B2 3/2006 Oliver et al.  
 7,054,750 B2 5/2006 Rodney et al.  
 7,064,676 B2 6/2006 Hall et al.  
 D525,550 S \* 7/2006 Egidio ..... D10/102  
 7,072,801 B2 \* 7/2006 James ..... G05B 23/0267  
 702/188  
 7,073,125 B1 7/2006 Nystrom et al.  
 7,100,688 B2 9/2006 Stephenson et al.  
 7,140,452 B2 11/2006 Hutchinson  
 7,142,986 B2 11/2006 Moran  
 7,143,363 B1 \* 11/2006 Gaynor ..... G06F 3/14  
 715/771  
 D533,474 S \* 12/2006 Megale ..... D10/102  
 7,168,506 B2 1/2007 Boucher et al.  
 7,172,037 B2 2/2007 Dashevskiy et al.  
 D538,719 S \* 3/2007 Kraus ..... D12/192  
 D543,139 S 5/2007 Kraus  
 D543,476 S 5/2007 Barmettler et al.  
 7,219,747 B2 5/2007 Gleitman et al.  
 7,225,879 B2 6/2007 Wylie et al.  
 D545,707 S 7/2007 Barmettler et al.  
 7,243,719 B2 7/2007 Baron et al.  
 7,243,735 B2 7/2007 Koederitz et al.  
 7,251,590 B2 7/2007 Huang et al.  
 D549,721 S 8/2007 Ito et al.  
 D549,722 S 8/2007 Ito et al.  
 D552,121 S \* 10/2007 Carl ..... D14/488  
 D553,142 S 10/2007 Blencowe  
 D553,143 S 10/2007 Blencowe  
 D553,144 S 10/2007 Blencowe  
 D555,164 S \* 11/2007 Sergio ..... D14/486  
 7,313,480 B2 12/2007 Chen et al.  
 7,327,634 B2 2/2008 Perry et al.  
 D563,977 S 3/2008 Carl et al.  
 7,357,197 B2 4/2008 Schultz et al.  
 D568,776 S 5/2008 Hall et al.  
 7,441,189 B2 10/2008 Michaels  
 D581,302 S 11/2008 Wyszogrod et al.  
 D589,388 S 3/2009 Sauter  
 D602,037 S 10/2009 Nash et al.  
 D603,283 S 11/2009 Colussi et al.  
 D611,861 S 3/2010 Wiedeman et al.  
 7,681,663 B2 3/2010 Cobern  
 7,717,841 B2 \* 5/2010 Brendley ..... G16H 20/70  
 600/27  
 7,726,255 B2 6/2010 Nakamichi  
 7,735,579 B2 6/2010 Gopalan et al.  
 7,748,474 B2 7/2010 Watkins et al.  
 7,775,099 B2 8/2010 Bogath et al.  
 D629,410 S 12/2010 Ray et al.  
 D631,808 S 2/2011 Yamazaki  
 7,913,773 B2 3/2011 Li et al.  
 D637,196 S 5/2011 Ray et al.  
 7,979,522 B2 \* 7/2011 Lunsford ..... G16H 30/40  
 709/223  
 D644,574 S 9/2011 Vardis

(56)

References Cited

U.S. PATENT DOCUMENTS

D650,300 S 12/2011 Fujioka et al.  
 D654,415 S 2/2012 Mizuno  
 8,121,971 B2 2/2012 Edwards et al.  
 8,180,614 B2 5/2012 Pabon et al.  
 8,210,283 B1 7/2012 Benson et al.  
 8,214,188 B2 7/2012 Bailey et al.  
 D667,434 S 9/2012 Phelan  
 D671,022 S 11/2012 Hoffman et al.  
 D671,670 S 11/2012 Sonneman  
 D673,487 S 1/2013 Hanson et al.  
 D675,637 S \* 2/2013 Willard ..... D14/486  
 8,397,562 B2 3/2013 Wassell et al.  
 D681,649 S 5/2013 Fletcher et al.  
 D681,662 S 5/2013 Fletcher et al.  
 D681,670 S \* 5/2013 Fletcher ..... D14/491  
 8,442,764 B2 5/2013 Schulze et al.  
 D683,645 S 6/2013 Bode et al.  
 8,453,764 B2 6/2013 Turner et al.  
 D687,043 S 7/2013 Matas et al.  
 D687,838 S \* 8/2013 Poeppel ..... D14/485  
 8,504,342 B2 8/2013 Bailey et al.  
 8,525,690 B2 9/2013 Furo et al.  
 8,577,487 B2 11/2013 Tarte et al.  
 8,622,153 B2 1/2014 McLoughlin et al.  
 8,640,791 B2 2/2014 Turner et al.  
 D701,226 S 3/2014 Jung  
 D701,869 S 4/2014 Matas et al.  
 8,684,108 B2 4/2014 Turner et al.  
 8,798,978 B2 8/2014 Ertas et al.  
 8,817,024 B2 8/2014 Katoh et al.  
 8,819,550 B2 \* 8/2014 Evans ..... G06F 3/04886  
 715/708  
 8,838,426 B2 9/2014 Aldred et al.  
 D723,582 S \* 3/2015 Green ..... D14/486  
 8,977,523 B2 3/2015 Ertas et al.  
 D729,839 S 5/2015 Bray et al.  
 D731,545 S 6/2015 Lim et al.  
 D744,494 S 12/2015 Roberts et al.  
 D745,054 S 12/2015 Bray et al.  
 9,249,654 B2 2/2016 Strachan et al.  
 D753,678 S \* 4/2016 Clarke ..... D14/485  
 D755,240 S 5/2016 Cavander et al.  
 D755,825 S 5/2016 Hwang et al.  
 D764,491 S \* 8/2016 Green ..... D14/485  
 D778,303 S 2/2017 Deusing et al.  
 D781,890 S \* 3/2017 Gathman ..... D14/486  
 D786,913 S 5/2017 Dye et al.  
 D788,154 S 5/2017 Kim et al.  
 D788,792 S 6/2017 Alessandri et al.  
 9,696,198 B2 7/2017 Turner et al.  
 D798,889 S \* 10/2017 Mochel ..... D14/486  
 D799,519 S 10/2017 Broughton et al.  
 D800,144 S 10/2017 Anderson  
 D800,149 S \* 10/2017 Messineo, Jr. .... D14/486  
 D800,163 S 10/2017 Tsukahara  
 D800,739 S 10/2017 Sukumaran et al.  
 D801,368 S 10/2017 Broughton et al.  
 D801,369 S 10/2017 Chaudhri et al.  
 D802,020 S 11/2017 Kim et al.  
 D803,849 S \* 11/2017 Chaudhri ..... D14/485  
 D806,094 S \* 12/2017 Maisonneuve ..... D14/485  
 D806,097 S 12/2017 Rahn et al.  
 D806,123 S 12/2017 Tsukahara  
 D806,725 S 1/2018 Ryu  
 D808,983 S 1/2018 Narinedhat et al.  
 D808,988 S \* 1/2018 Ayvazian ..... D14/485  
 D808,989 S \* 1/2018 Ayvazian ..... D14/485  
 D809,535 S 2/2018 Park et al.  
 D809,543 S 2/2018 Broughton et al.  
 D810,757 S \* 2/2018 Bae ..... D14/485  
 D843,381 S \* 3/2019 Wassell ..... E21B 44/00  
 D14/485  
 D872,109 S \* 1/2020 Folken ..... D14/485  
 D874,513 S \* 2/2020 Whitmore ..... D14/488  
 D877,171 S \* 3/2020 Poindexter ..... D14/486

10,690,555 B2 \* 6/2020 Adams ..... B64D 43/00  
 D890,200 S \* 7/2020 Kokubo ..... D14/486  
 D905,074 S \* 12/2020 Lin ..... D14/485  
 2002/0011358 A1 1/2002 Wassell  
 2002/0088648 A1 7/2002 Krueger et al.  
 2002/0120401 A1 8/2002 Macdonald et al.  
 2003/0056608 A1 3/2003 Ishimaru  
 2003/0168257 A1 9/2003 Aldred et al.  
 2004/0111507 A1 6/2004 Villado et al.  
 2004/0256152 A1 12/2004 Dashevskiy et al.  
 2005/0109097 A1 5/2005 Bogath et al.  
 2005/0197719 A1 9/2005 Renner  
 2005/0197777 A1 9/2005 Rodney et al.  
 2006/0065440 A1 3/2006 Hutchinson  
 2006/0195265 A1 8/2006 Schen et al.  
 2006/0195307 A1 8/2006 Huang et al.  
 2006/0215491 A1 9/2006 Hall  
 2007/0029112 A1 2/2007 Li et al.  
 2007/0056771 A1 3/2007 Gopalan et al.  
 2007/0061081 A1 3/2007 Moran  
 2007/0289778 A1 12/2007 Watkins et al.  
 2008/0238913 A1 \* 10/2008 Katoh ..... B60K 37/02  
 345/418  
 2009/0073186 A1 3/2009 Caniglia et al.  
 2010/0139977 A1 6/2010 Watkins et al.  
 2010/0163306 A1 7/2010 Paton et al.  
 2010/0214121 A1 8/2010 Puro et al.  
 2011/0024188 A1 2/2011 Wassell et al.  
 2011/0029919 A1 2/2011 Woltkamp  
 2011/0186353 A1 8/2011 Turner et al.  
 2011/0208339 A1 8/2011 Tarte et al.  
 2011/0214878 A1 9/2011 Bailey et al.  
 2011/0220410 A1 9/2011 Aldred et al.  
 2012/0048621 A1 3/2012 Stewart et al.  
 2012/0123757 A1 5/2012 Ertas et al.  
 2012/0130693 A1 5/2012 Eras et al.  
 2012/0222900 A1 9/2012 Rodney et al.  
 2012/0272186 A1 10/2012 Kraut  
 2013/0092438 A1 4/2013 Turner et al.  
 2013/0098683 A1 4/2013 Turner et al.  
 2014/0083765 A1 \* 3/2014 Hoult ..... E21B 44/00  
 175/24  
 2014/0251688 A1 9/2014 Turner et al.  
 2015/0014058 A1 1/2015 Wassell et al.  
 2015/0083492 A1 3/2015 Wassell

FOREIGN PATENT DOCUMENTS

CN 101446191 A 6/2009  
 CN 102822752 A 12/2012  
 CN 202832481 U 3/2013  
 CN 104295233 A 1/2015  
 DE 3434565 A1 3/1986  
 GB 2335450 A 9/1999  
 GB 2467626 A 8/2010  
 GB 2492906 A 1/2013  
 GB 2518282 A 3/2015  
 WO 9746793 A1 12/1997  
 WO 9928594 A1 6/1999  
 WO 2007149866 A2 12/2007  
 WO 2010059295 A1 5/2010  
 WO 2011017626 A1 2/2011  
 WO 2011094689 A1 8/2011  
 WO 2014011171 A1 1/2014

OTHER PUBLICATIONS

Littlechild, Ted, "Well control risks on HPHT wells may call for system upgrades" Nov. 8, 2011, posted at [drillingcontractor.org](http://drillingcontractor.org), [site visited Apr. 7, 2021]. <https://www.drillingcontractor.org/well-control-risks-on-hpht-wells-may-call-for-system-upgrades-11623> (Year: 2011).\*

"NetAdvantage for Windows Forms Release Notes—Mar. 12.1, 12.2 Service Releases" Mar. 20, 2013, posted at [infragistics12.rssing.com](http://infragistics12.rssing.com), [site visited Apr. 7, 2021]. [https://infragistics12.rssing.com/chan-8968963/all\\_p3.html](https://infragistics12.rssing.com/chan-8968963/all_p3.html) (Year: 2013).\*

(56)

**References Cited**

## OTHER PUBLICATIONS

Pushkar et al., Field Verification of Model-Derived Natural Frequencies of a Drill String, *J. Energy Resource Technology*, Sep. 2002, vol. 124, issue 3, 154, 1 pp. (Abstract).

APS Technology, *Advanced Systems for Drilling Performance*, 2009, 4 pp.

APS Technology, Inc., *WellDrill Analytical Software for Downhole Drilling Equipment*, 2009, 3 pp.

Apostal et al., A Study To Determine the Effect of Damping on Finite-Element-Based, Forced-Frequency-Response Models for Bottomhole Assembly Vibration Analysis, 65th Annual Technical Conference and Exhibition of the Society of Petroleum Engineers, Inc., Sep. 23-26, 1990, 14 pp.

APS Technology, Inc., *Vibration Isolation Sub*, Technical Data Sheet, 2009, 2 pp.

Durpiest et al., Maximizing Drill Rates with Real-Time Surveillance of Mechanical Specific Energy, SPE/IADC Drilling Conference, Feb. 23-25, 2005, Amsterdam, The Netherlands, 10 pp.

Johancsik et al., Torque and Drag in Directional Wells-Prediction and Measurement, Society of Petroleum Engineers of AIME, Jun. 1984, pp. 987-992.

Koederitz et al., A Real-Time implementation of MSE, AADE National Technical Conference and Exhibition, Wyndham Greenspoint, Houston, TX, Apr. 5-7, 2005, 7 pp.

Katie Mazerov, MWD/LWD advances push telemetry rates higher, expand capabilities in horizontal, HPHT, deepwater environments, *Data delivery/Drilling Contractor*, 6 pp.

Katie Mazerov, MWD/LD, advances push telemetry rates higher, expand capabilities in horizontal, HPHT, deepwater environments, *Drilling Contractor*, Jul.-Aug. 2013, 8 pp.

Mihajlovic et al., Analysis of Friction-Induced Limit Cycling in an Experimental Drill-String System, *Journal of Dynamic Systems, Measurement and Control*, Dec. 2004, pp. 709-720, vol. 126.

Pessier et al., Quantifying Common Drilling Problems With Mechanical Specific Energy and a Bit-Specific Coefficient of Sliding Friction, 67th Annual Technical Conference and Exhibition of the Society of Petroleum Engineers, Inc., Oct. 4-7, 1992, pp. 373-388.

Samuel et al., Tortuosity Factors for Highly Tortuous Wells: A Practical Approach, SPE/IARC Drilling Conference, Feb. 23-25, Amsterdam, The Netherlands, pp. 1-6.

R. Simon, Energy Balance in Rock Drilling, *Society of Petroleum Engineers*, Dec. 1963, vol. 3, issue 04, 3 pp.

APS Technology, Inc., *SureShot Surface Systems & Components*, Technical Data Sheet, 2009, 2 pp.

Tech Power Controls Co *Composite Catalog*, 2000, Houston, TX, 17 pp.

APS Technology, Inc., *SureShot Vibration Memory Module (VMM)*, Technical Data Sheet, 2009, 3 pp.

APS Technology, Inc., *Vibration Memory Sub (VMS)*, Technical Data Sheet, 2009, 2 pp.

APS Technology, Inc., *WellDrill 6 User Guide*, 6th Edition, Feb. 2008, 57 pp.

\* cited by examiner

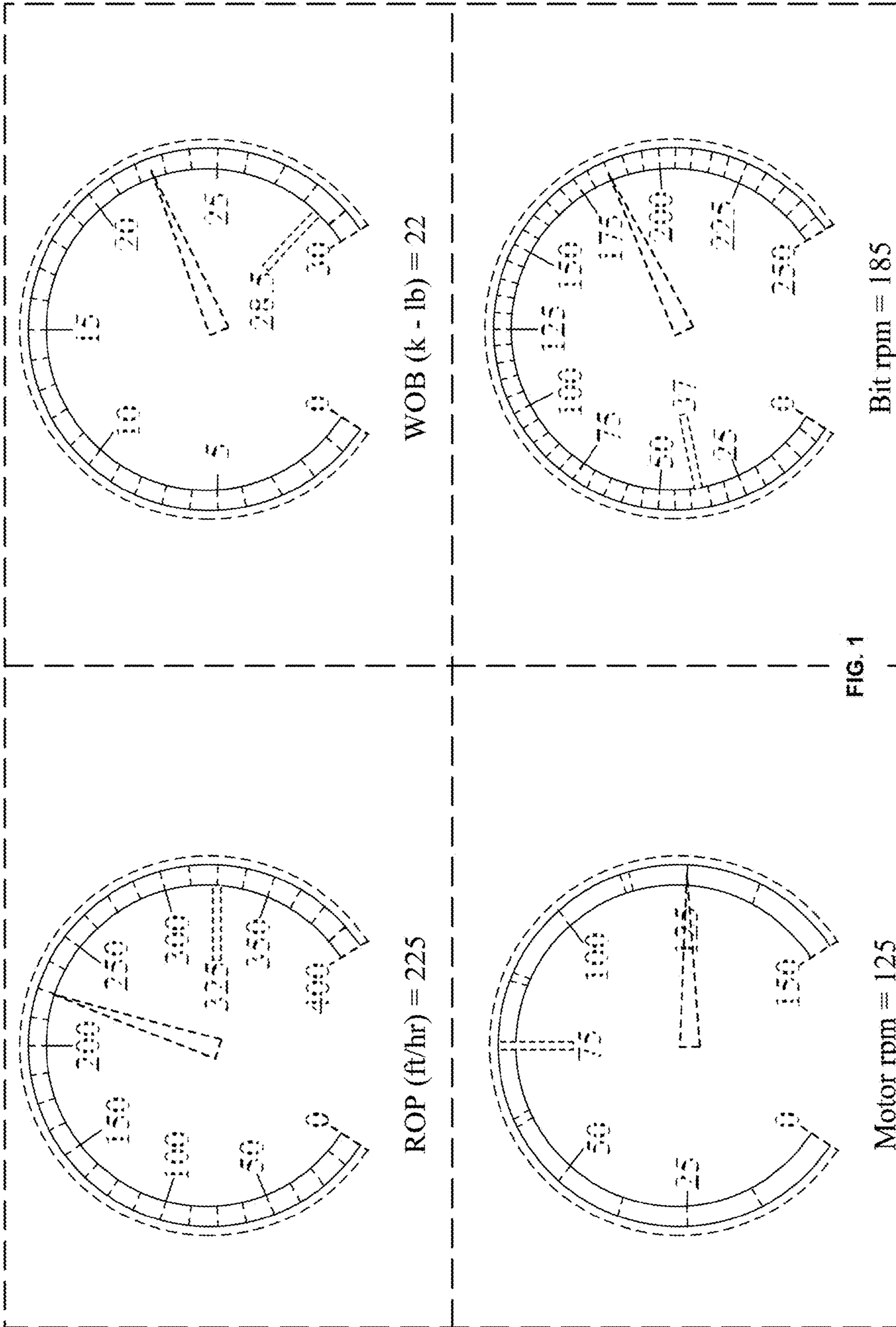


FIG. 1

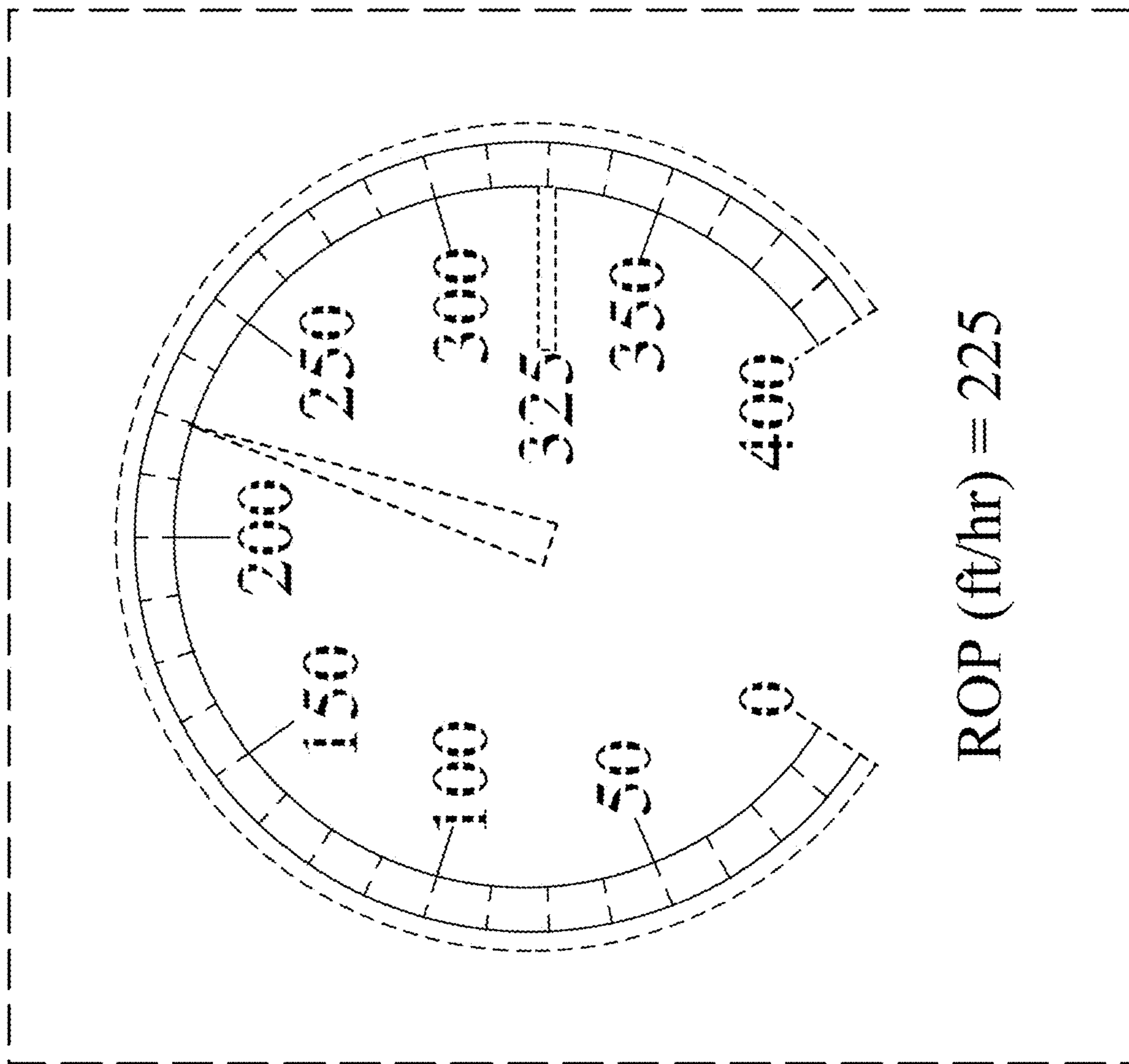


FIG. 2

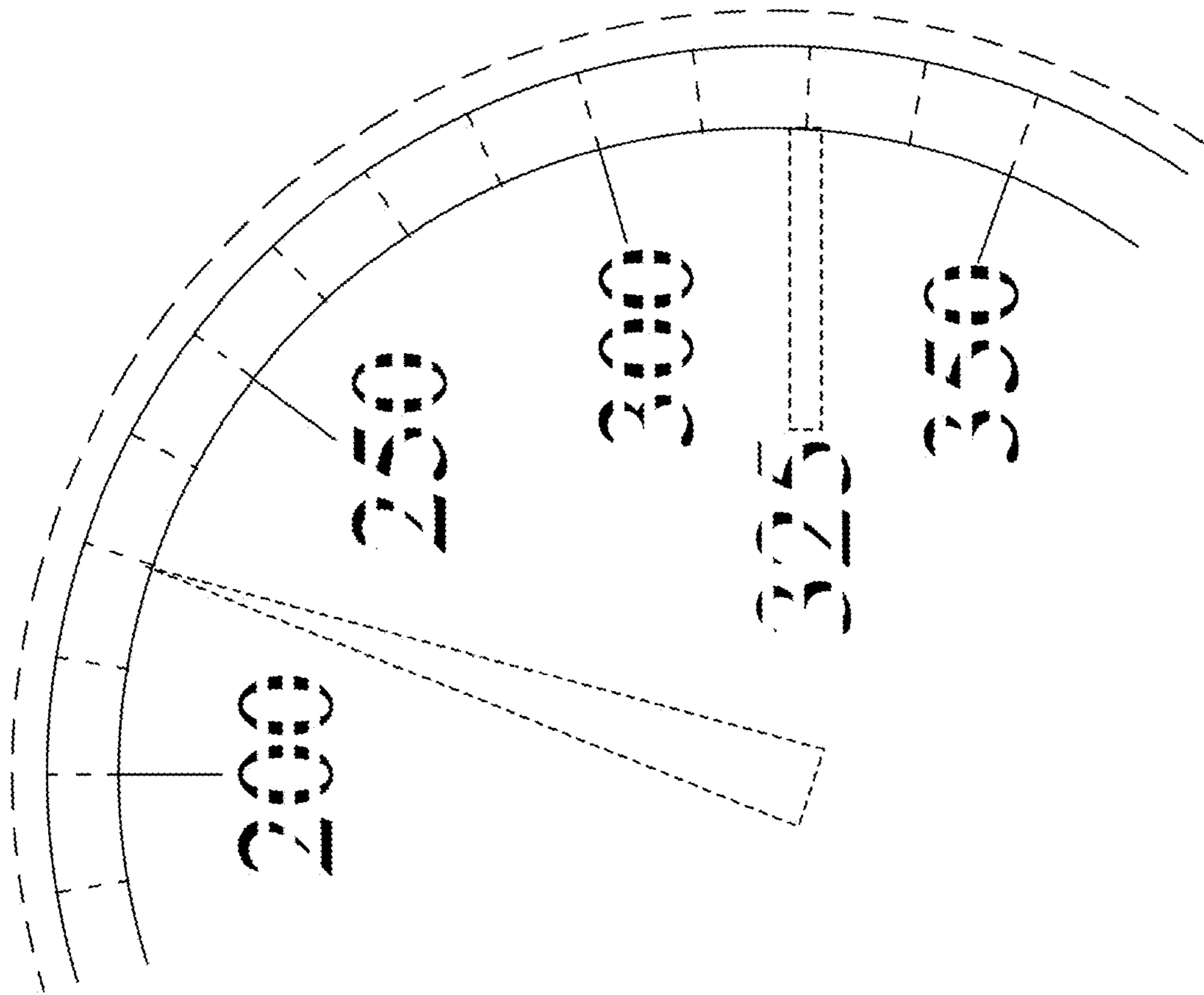


FIG. 3

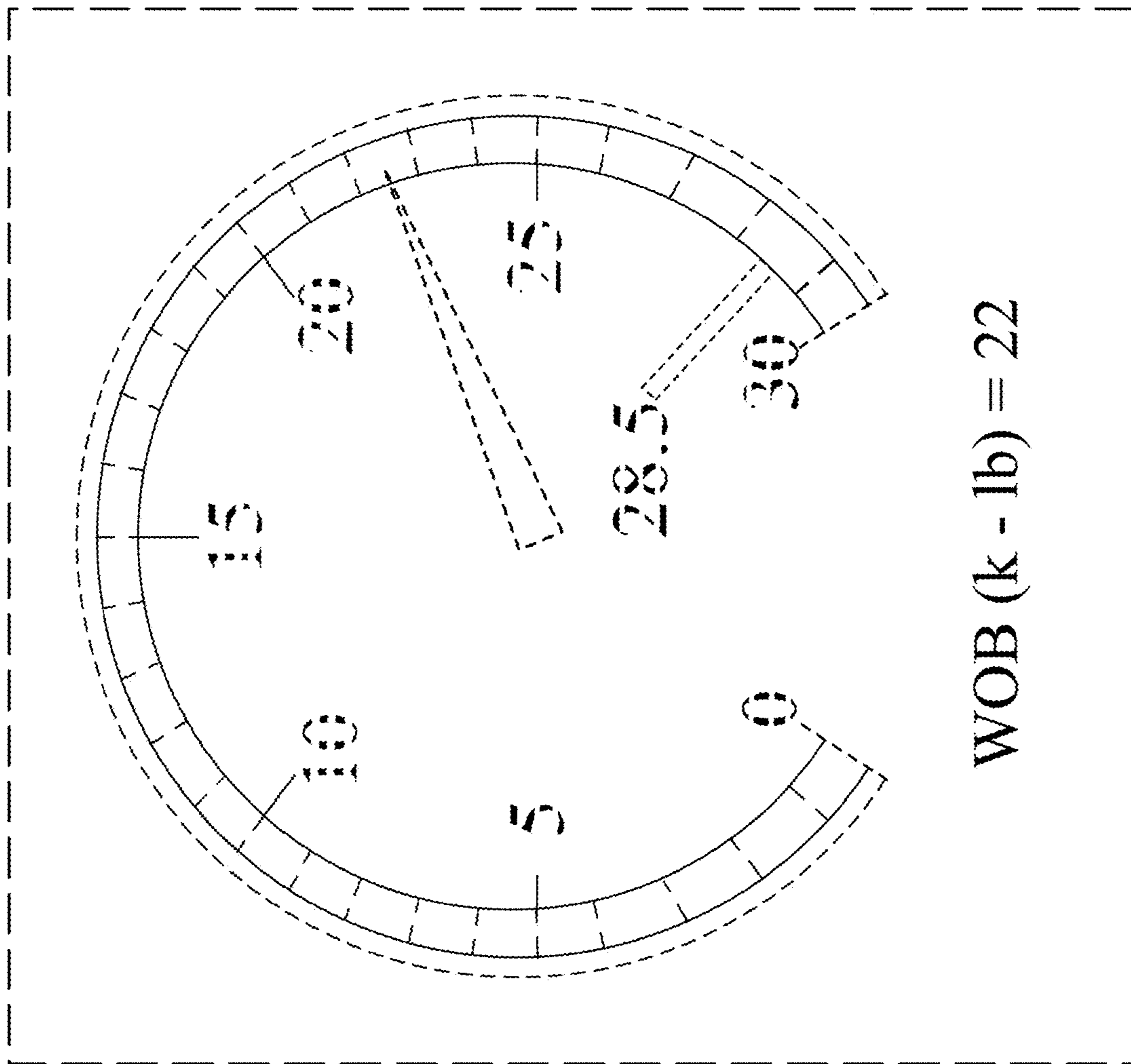


FIG. 4



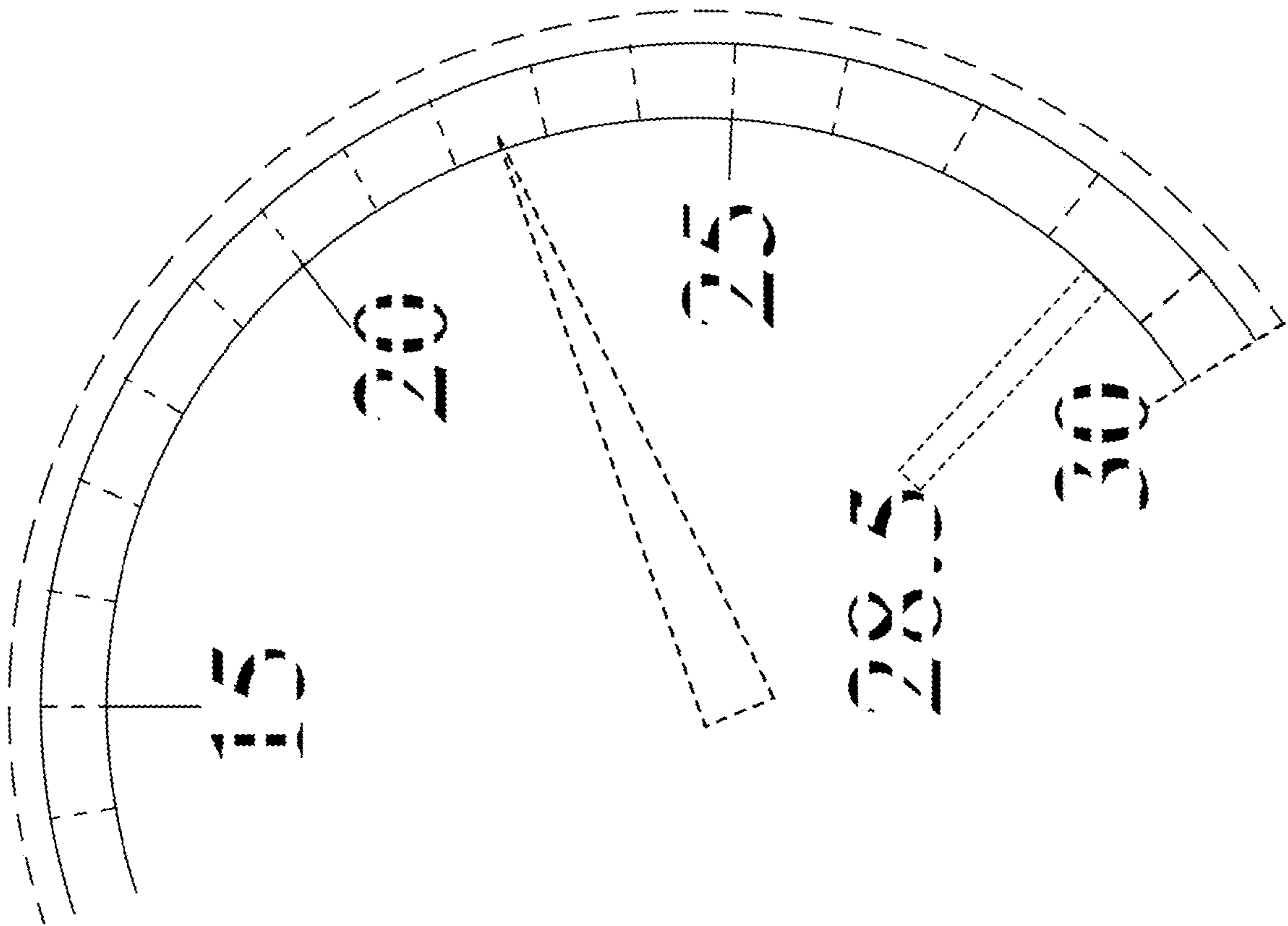


FIG. 5

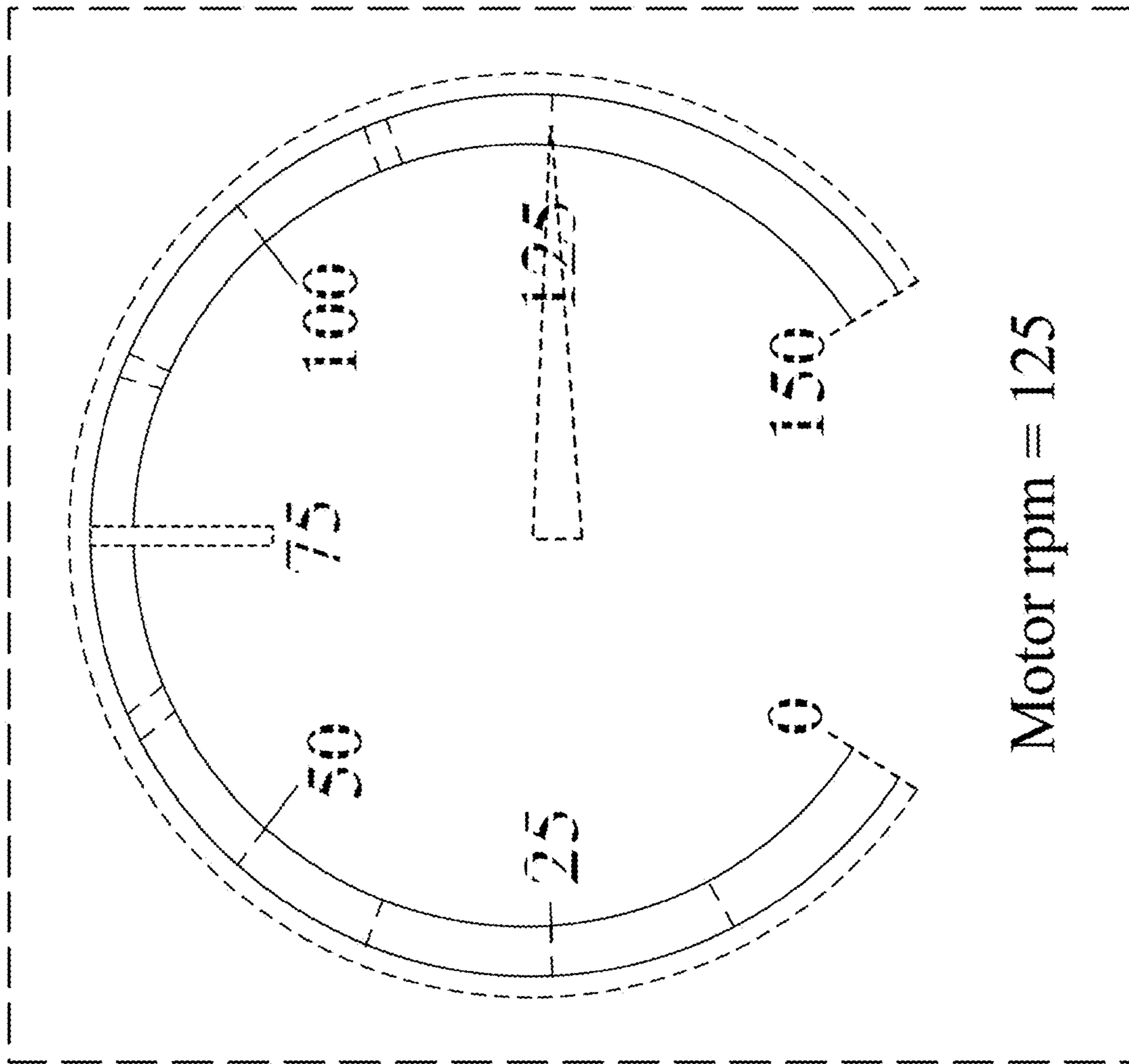


FIG. 6

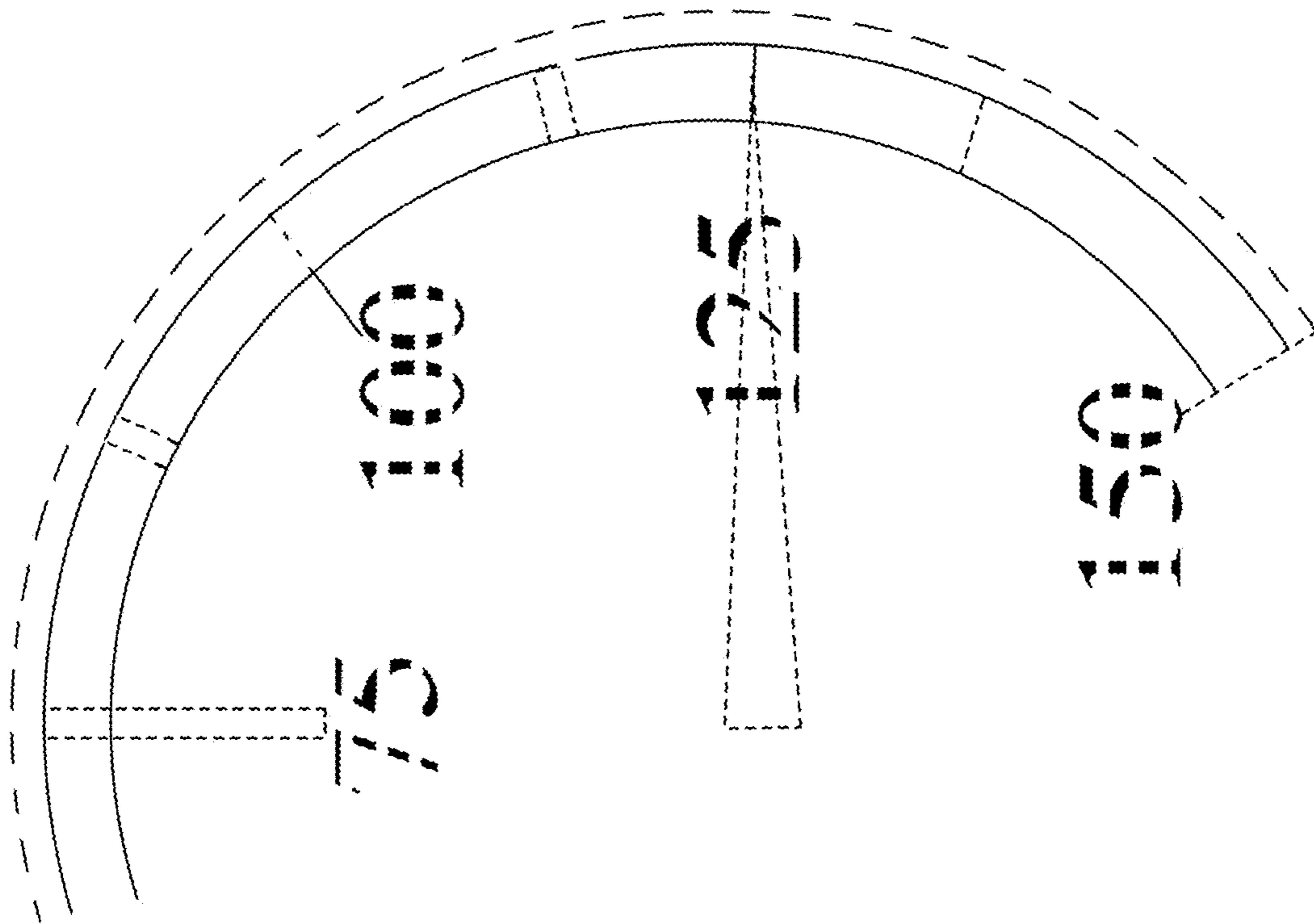


FIG. 7

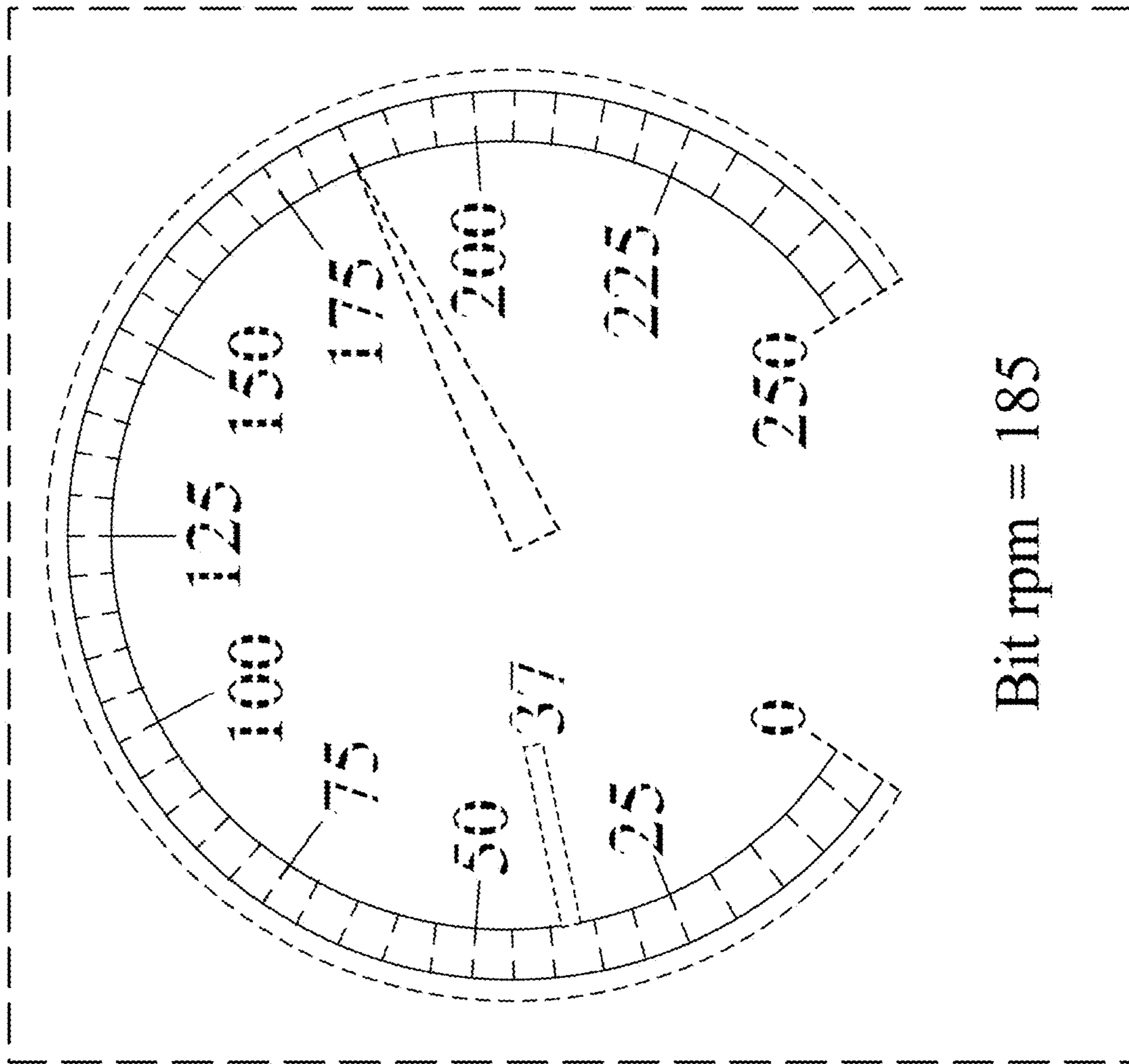


FIG. 8

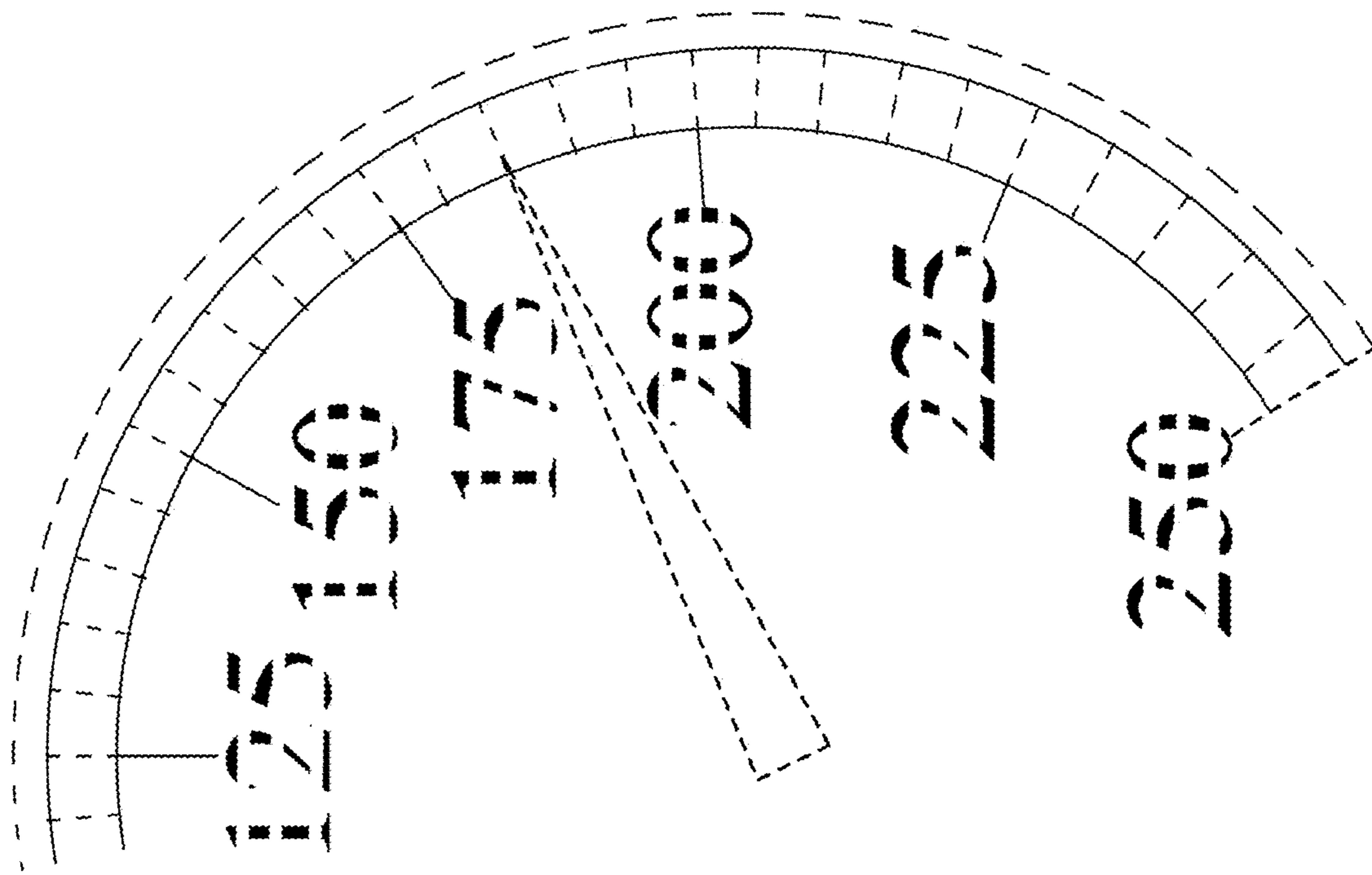


FIG. 9